

Subject: Integrated science

Topic: Forms of energy and energy change

Level: S.1

Learning objectives:

1. Content

Students should be able to:

Identify forms of energy stored and produced in different ways.

Identify the energy changes which occur in different

Identify the energy converter in energy change processes

2. Language

Students should be able to:

Use passive verbs to describe energy change

This activity was produced by a Leung Ka Po

Activity adapted from: --

S1 Integrated Science
Energy changes
Energy change in Shenzhou V
Worksheet 4

Name: _____ Class: _____ No.: _____ Date: _____



- *Shenzhou V* weighs 7800 kg. It is 8.55 m long and has a diameter of 2.8m. It has four sets of solar cells. They supply the external power for *Shenzhou V*. It has three parts that separate during flight. These are:
 - o The *orbital module*. This provides living space for the astronauts and contains scientific or military equipment. It separates and stays in orbit before the astronaut returns to earth. Then it continues its scientific or military observation duty. In the future it may be left behind, moored to a Chinese space station.
 - o The *re-entry capsule*. This has a 'headlight' shape and brings three to four astronauts back to earth. After slowing down, it separates from the service module. After re-entry (the return journey), a parachute is spread

out to slow it down. Just before landing, the heat shield is thrown away and small rockets fire to help it make a soft landing in the central Asian desert.

- o The *service module*. This contains the main spacecraft electronics and environmental systems. It also contains the liquid fuel rockets which enable the spacecraft to orbit (travel round) the earth and return to earth. It separates from the re-entry capsule after slowing down and is burnt up in the air.

Answer these questions about energy change in *Shenzhou V*.

- (a) What is the external power supply for *Shenzhou V* in space?

- (b) Explain the energy conversion brought about by the power supply.

- (c) The Orbital Module goes around the Earth at a height of 340 km and at very high speed. Write down two forms of energy that it has.

- (d) As the re-entry capsule returns through atmosphere, a heat shield is used to protect it from burning up by the air. Explain the energy change on the return journey.

- (e) The service module contains the liquid fuel rockets. Explain the energy conversion when the fuel is burnt.

- (f) A foreign magazine reported that the launch of Shenzhou V was a joke because the technology was 40 years behind America. What is your opinion about the development of space technology in our mother nation?
